



## Best Practices in Wood Waste Recycling

### ***Bulk Reduction Equipment***

#### **Material: Wood Waste**

**Issue:** Wood waste supplies are diverse, ranging from sawdust or shavings to large stumps, containers or portions of structural framing. In some situations, the larger pieces of wood waste are difficult to load into the primary size reduction equipment. On occasion, the material is simply too large to fit into the equipment throat. As a result, reducing bulk before conveying to the primary size-reduction equipment presents some advantages.

**Best Practice:** This Best Practice recommends the use of bulk reduction equipment to prepare large wood waste material for feeding into size reduction equipment. The appropriate type of bulk reduction equipment depends on the characteristics of the incoming raw material and downstream equipment. These equipment are discussed below:

**Mobile Bulk Reduction Attachments:** Rolling stock equipment can be fitted with various attachments for reducing the bulk of large wood waste materials. The types of attachments available for front-end loaders and excavators include shears, pulverizers, densifier grapples, and stump splitters. These attachments can be customized to reduce raw materials ranging from pallets and structural framing to stumps.

**Rolling Stock Compaction:** This method of bulk reduction is accomplished by driving the rolling stock over large wood waste before loading it into the processing system. This type of compaction may create too many small particles and can introduce contaminants. Generally, wheeled rolling stock compacts better without creating as much fines as tracked equipment.

**Hydraulic Compaction:** This equipment consists of a crushing surface driven by hydraulic cylinders. The compactor reduces bulk by compressing large wood waste against a reinforced conveyor bottom. Hydraulic compaction works well, but may require a lot of maintenance. The compactor can be a stationary hopper-fed unit that is loaded by rolling stock or an in-line conveyor compaction unit that is operated by personnel on a picking line.

**Mechanical Shearing:** This equipment consists of a hydraulically driven shear that periodically slices through the wood waste traveling on a conveyor. There is a break in the conveyor bottom where the shear passes through the wood waste. Mechanical shearing can be expensive and is potentially dangerous if not properly designed.

**Pre-Crusher:** This equipment features a rotating crushing device and a feeding mechanism to provide coarse size reduction of material prior to further screening and size reduction.

**Implementation:** These types of bulk reduction methods can be designed into existing and green-field wood waste processing facilities that are experiencing or anticipating problems with large wood waste materials. When selecting a piece of equipment for bulk reduction an operator should consider the following issues:



## Best Practices in Wood Waste Recycling

*Operational:* The prevalent types and variations of wood waste raw materials handled at the processing facility are a major determinant of the appropriate type of bulk reduction equipment. Reducing the bulk of stumps will require more specialized equipment than oversized lumber structures. Through work with an equipment vendor, the equipment can be adequately sized to handle the types and volumes of wood waste processed at a given facility. Removing dirt and rock in the root ball of a stump requires skilled shears operation. This cleaning is most effective when stumps have aged four to eight months.

*Cost:* The use of rolling stock and rolling stock attachments is likely to be the most cost-effective method of bulk reduction in most cases. Also, by directing the rolling stock to perform multiple tasks, operators can work to maximize the productivity of the equipment and labor. The initial cost of rolling stock equipment is offset by its multi-purpose utilization at a processing facility. Stationary compaction, shearing, and pre-crushing systems are expensive and require a steady flow of oversized material to justify the investment.

*Maintenance:* Wheeled rolling stock used to compact bulky wood waste should be equipped with solid tires to avoid tire puncture by metal contaminants. Hydraulic compactors generally require a significant amount of maintenance. Shearing equipment is likely to require regular maintenance for sharpening when processing large wood waste with metal contaminants.

*Safety:* Shearing and crushing equipment is likely to unintentionally eject material. Bulk reduction equipment should be well-guarded or shrouded to reduce danger from any flying debris. Due to the potential for flying debris, rolling stock should perform the bulk reduction work in an area isolated from bystanding personnel.

***Benefits:*** The use of bulk reduction equipment to prepare large pieces of wood waste can improve the material flow into primary size reduction equipment. This initial stage of preparation will lead to increased utilization of production capacity and reduce downtime due to flow blockages. A secondary benefit of bulk reduction is that contaminants are often loosened from the material and are therefore more easily removed before reaching the processing equipment.

***Application Site:*** Processing Facility.

***Contact:*** For more information about this Best Practice, contact CWC (206) 443-7746, e-mail [info@cw.org](mailto:info@cw.org).

### ***References:***

1. International Resources Unlimited, Inc.; Eugene, OR.
2. Lyman, Mark; West Salem Machinery; Salem, OR.
3. Pemberton, Inc.; Longwood, FL.
4. See Appendix for an Equipment Manufacturer's List.
5. "Specialty Loader and Excavator Attachments"; equipment brochure; Pemberton, Inc.
6. Walsh, Dan; Northwest Wood and Fiber Recovery; Portland, OR.
7. Yeasting, John; Re-Sourcing Associates; Seattle, WA.

Issue Date / Update: March 1997